

Implications of Principles-Based Regulation (PBR)

Actuaries' Club of the Southwest

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Agenda

- **Key Provisions of the New Regulation**
- Reactions from the Rating Agencies
- State of the Industry
- Implications of the New PBR

Basic PBR Framework – Methodology and Assumptions

- Assumptions not stochastically modeled will be based on “Anticipated Experience” plus a margin that includes a provision for adverse deviation and estimation error: “Prudent Experience”
- Assumptions are not “locked-in” at issue
 - Should include dynamic assumptions for the stochastic modeling
- Margins will be determined by the actuary using professional judgment, subject the guidelines established by the NAIC and ASOPs
- Common set of Economic Scenarios
- Hedging can be included if it qualifies under CDHS requirements
 - Existing hedges must be included
- The NAIC may prescribe numeric limits, caps or ranges on certain margins

Basic Framework – Life Reserves (LRWG)

- Scope: all (major) individual life products
 - Some “non-risky” products likely to be excluded (TBD)
- Initial approach for LRWG reserve will be prospective only; may allow retroactive application to inforce (or subset) later
 - VA CARVM applies retrospectively
- Drafts of Model Regulation was exposed for comment at March 2007 LHATF meeting (available on Academy website)
- Reserve is the greater of:
 - A deterministic, seriatim, single scenario reserve calculation
 - A stochastically derived reserve using a prescribed CTE level
- Since the stochastic reserve is done in the aggregate, risk offsets between contracts will be recognized
- Implementation is expected for year-end 2008

Basic Framework (LRWG) – Deterministic Reserves

- Based on Gross Premium Valuation (GPV) method
- $GPV \text{ reserve} = PV \text{ of future benefits and expenses, less PV of future gross premiums}$
- Not designed to capture tail risk
- Subject to a cash surrender value floor on a contract by contract basis
- For products excluded from the scope, an alternative, simplified methodology is being considered

Basic Framework (LRWG) – Stochastic Reserves

- Multiple scenarios will be used to properly capture the “tail risk” of the contract (risks that have high impact but low probability)
- Only interest rates and equity returns will be modeled stochastically
- Will use a CTE (conditional tail expectation) level that is set by regulators, such as 65 CTE
- Reserve for each scenario will be based on the Greatest PV of Accumulated Deficiencies (GPVAD)
- GPVAD reserve = starting assets plus the greatest PV of accumulated deficiencies in any future year
- The accumulated deficiency for each year in the projection = the “working reserve” less accumulated assets (working reserve is still being defined)

Source: American Academy of Actuaries

Basic Framework – Variable Annuities (VA)

- RBC C-3 Phase II went into effect at year-end 2005
 - Some modifications were made for year-end 2006
- Guideline (AG) VA CARVM is being finalized
 - Considerable debate in the last several months
 - Compromise based on proposal from Hartford Life, using CTE 70, was exposed September, 2006
 - Would apply to all contracts issued on or after January 1, 1981
 - Proposed effective date of December 31, 2007
 - Reserves are the greater of the reserves determined from stochastic projections and a deterministic standard scenario
 - LHATF VA CARVM Survey is underway (results due April 15)
 - VA CARVM WG recommended changes to AG VA CARVM
 - Expecting subgroup recommendation for updates to LHATF by June 2007

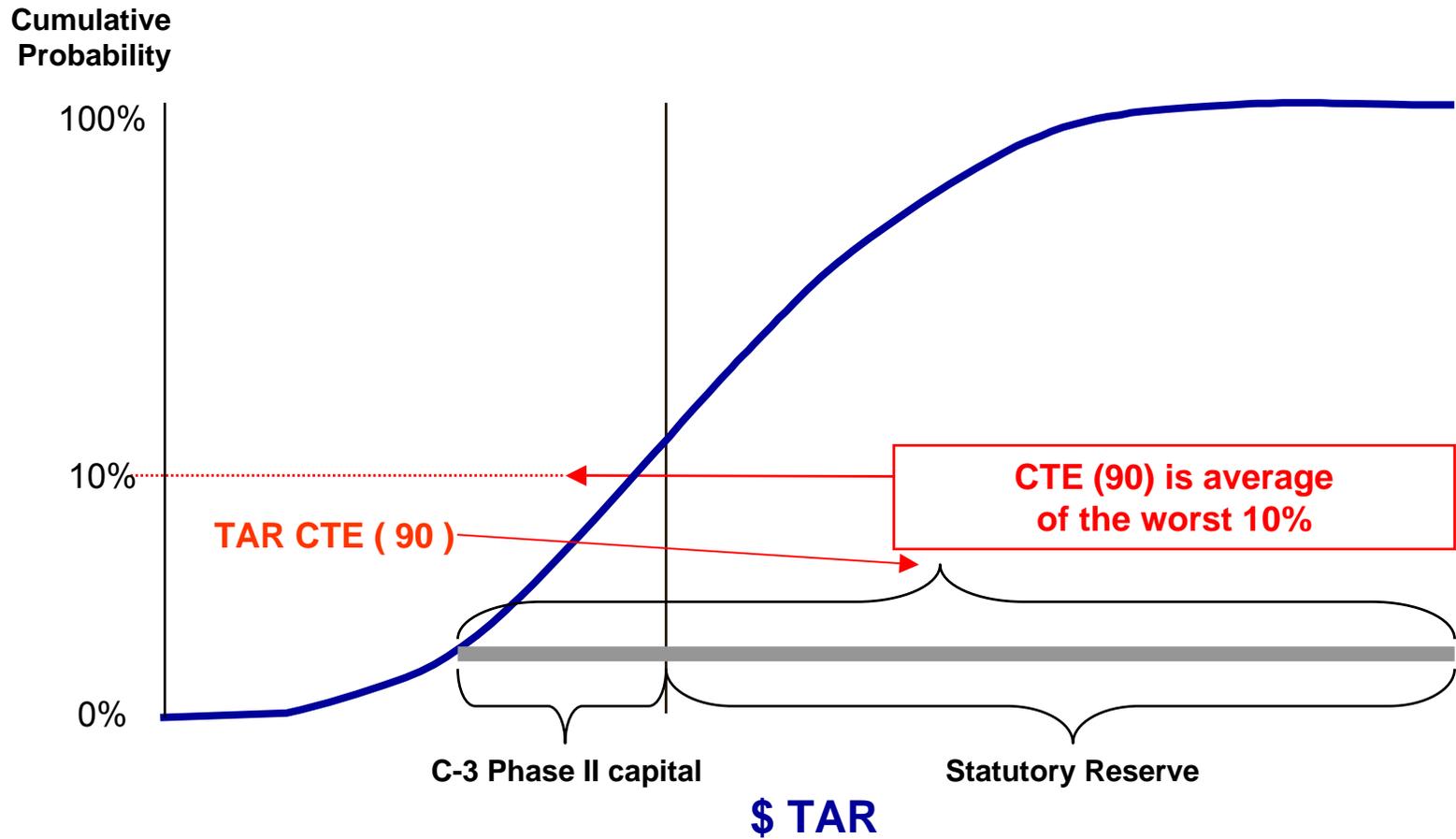
Source: American Academy of Actuaries

VA CARVM methodology

- Conditional Tail Expectation (CTE) amount
 - Inforce business is projected using scenarios meeting certain calibration requirements. For each scenario, the greatest present value of the accumulated deficiencies is calculated in aggregate using prudent best estimate assumptions. The calculated reserve is the CTE 70 of the scenario greatest present values, i.e., the average of the worst 30% of the results
 - A factor-based alternative methodology may be used to determine the CTE amount for contracts without VAGLBs
- Deterministic scenario
 - The standard scenario reserve for each contract is the sum of an AG33-like reserve and greatest present value of accumulated net revenue projected under specified immediate drop and growth rates, and using prudent estimate mortality, lapse and withdrawal assumptions

CTE(90) Captures Low-Frequency, High-Severity Events: The 10% Worst Situations

Distribution of Total Asset Requirement (TAR)



Annuity Reserves Work Group (ARWG)

- Mission: To develop principles-based reserve requirements for all non-variable annuity products
 - Deferred & immediate annuities, EIAs, GICs, structures, etc.
 - Current list includes 22 products
- Quarterly reporting to LHATF
 - Contains partial outline of tentative methodology
 - Conclusions on certain issues
- Five modeling teams have been set up:
 - Using ALFA, Axis, MoSes, Prophet, TAS software
- Work is well underway
 - Initial results are being compiled
 - Working towards year-end 2008 implementation timeline

Tentative ARWG issue resolutions

- Alternative reserve calculation option
 - Similar to C-3 Phase I with predetermined scenarios and weights
 - No CTE calculation
 - Not done by Academy in generalized fashion for all companies
 - Rather, company develops its own proprietary predetermined scenarios and weights
- Discount rates for Greatest Present Value of Accumulated Deficiencies (GPVAD)
 - Identify starting assets \geq reserve to be determined and project net investment yields for discounting
 - Ignore policy loans and hedge assets for hedging liabilities
 - Unlike use of Treasury yields, offers advantage of getting the same answer if done again using only assets backing reserves

Tentative ARWG issue resolutions (cont'd) and Next Steps

- Working reserve
 - Cash value if one exists and “0” otherwise
 - If working reserve on payouts set to PV of income payments, that becomes the minimum reserve due to GPVAD mechanics
- Projected credited rates
 - Policy loan interest and investment income from hedge assets not required to be used in determination of credited rates
 - Gains on hedges bought as part of regular investment policy should be counted toward excess interest
- Next Steps
 - Some discussion on merging VA CARVM and ARWG report into a single, combined “Annuity Reserve” document
 - Still significant work to be done
 - On track for adoption at year-end 2008

C-3 Phase I – Fixed Annuities

- Applies to companies that do cash flow testing
- A significant change was implemented for year-end 2006
 - No longer optional for companies with \geq \$100 million in assets
 - Many companies were not aware of this change
- Also, C-3 Phase I analysis can be combined with general account portion of C-3 Phase II for variable annuities
- No changes for companies with less than \$100 million in assets
 - C-3 Phase I is still optional
 - Companies still subject to exemption test

C-3 Phase II updates

- C-3 Phase II instruction changes
 - Adopted by NAIC in June 2006, based on input from LCAS
- Key changes included
 - Five step process expanded to nine steps, including revised order for tax adjustment
 - Certification to be submitted with RBC filing
 - Standard scenario returns: initial drop on equities is now at 20%
- Other comments
 - Documentation has been lacking in detail and clarity
 - Regulators are expected to place greater scrutiny on allowing full credit for reinsurance contracts with various limits and deductibles
 - Some discussion under way on allowing full release of reserve margins
 - New York State Insurance Department has suggested a variety of changes for year-end 2007 – under discussion at NAIC

New RBC models in development

- Life (“C-3 Phase III”)
 - Work is well underway (“LCWG”)
 - Methodology is similar to C-3 Phase II, using CTE 90 and GPVAD
 - Expecting year-end 2008 implementation
- Fixed annuities (“C-3 Phase IV”)
 - Work is just starting (“ACWG”)
 - Key focus on EIAs
 - Methodology and timelines similar to C-3 Phase II
 - Will include all annuity products, once completed
- Common issues to both methods
 - Will apply to both in-force and new business
 - NAIC is looking to have draft capital models by mid-year 2007
 - Once completed, these will encompass all life and annuity products
 - Treatment of hedges consistent with reserve models
 - PBA peer review is likely to be extended to capital models as well

Other PBR activities

- “Consistency” Working Group is currently discussing a number of issues concerning the relationship of capital and reserves, including
 - Role of reserves versus capital
 - Updated PBR “Principles”
 - Developing a PBR “Glossary of Terms”
 - Assumption reporting
- “Modeling Efficiency” Working Group is looking at the reasonableness of the stochastic modeling requirements
 - Looking to suggest “smart modeling” techniques
- “Economic Scenario” Working Group is discussing
 - Reparameterization of C-3 Phase I interest rate model
 - Developing calibration criteria applicable to internal models

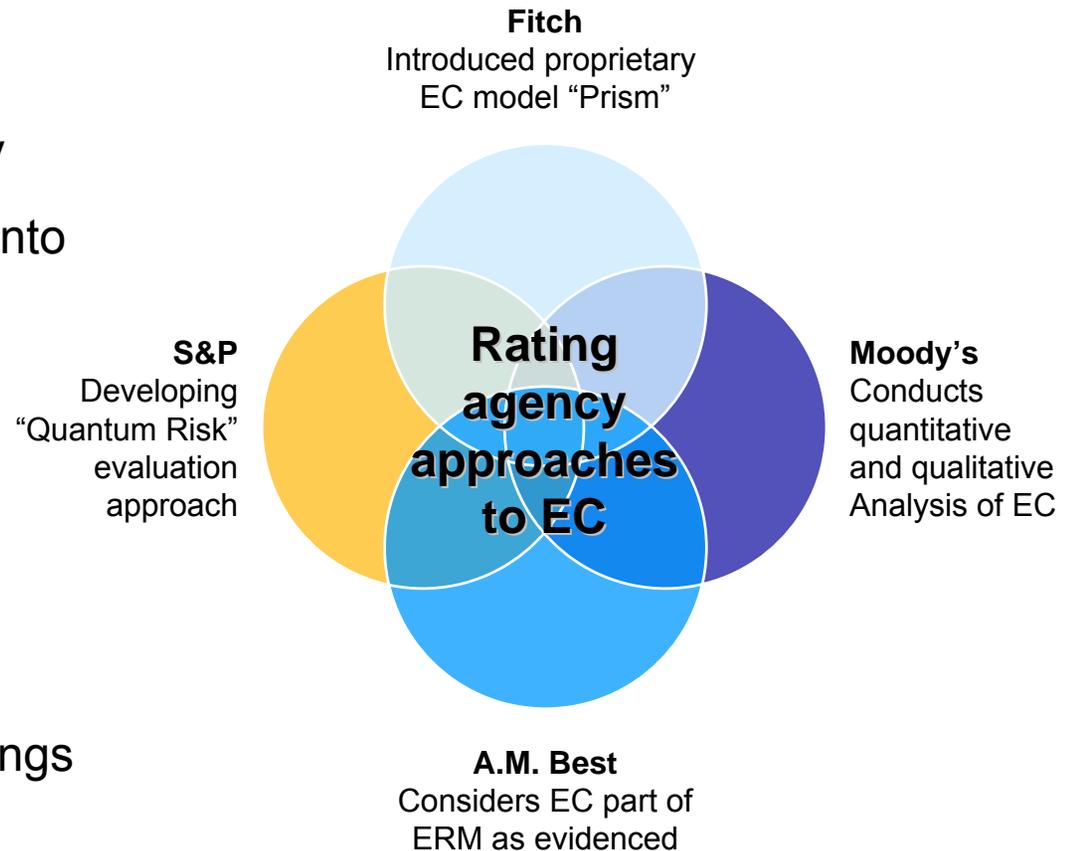
Source: American Academy of Actuaries

Agenda

- Key Provisions of the New Regulation
- **Reactions from the Rating Agencies**
- State of the Industry
- Implications of the New PBR

Rating agencies' views of capital adequacy have changed

- Rating agencies are increasingly considering proprietary models when assessing capital adequacy
- Building economic models into their rating process during ERM reviews
- Expecting companies to demonstrate balance between qualitative and quantitative ERM
- Linking capital adequacy requirements directly to ratings



Standard & Poor's: Strategic view of insurance company ERM

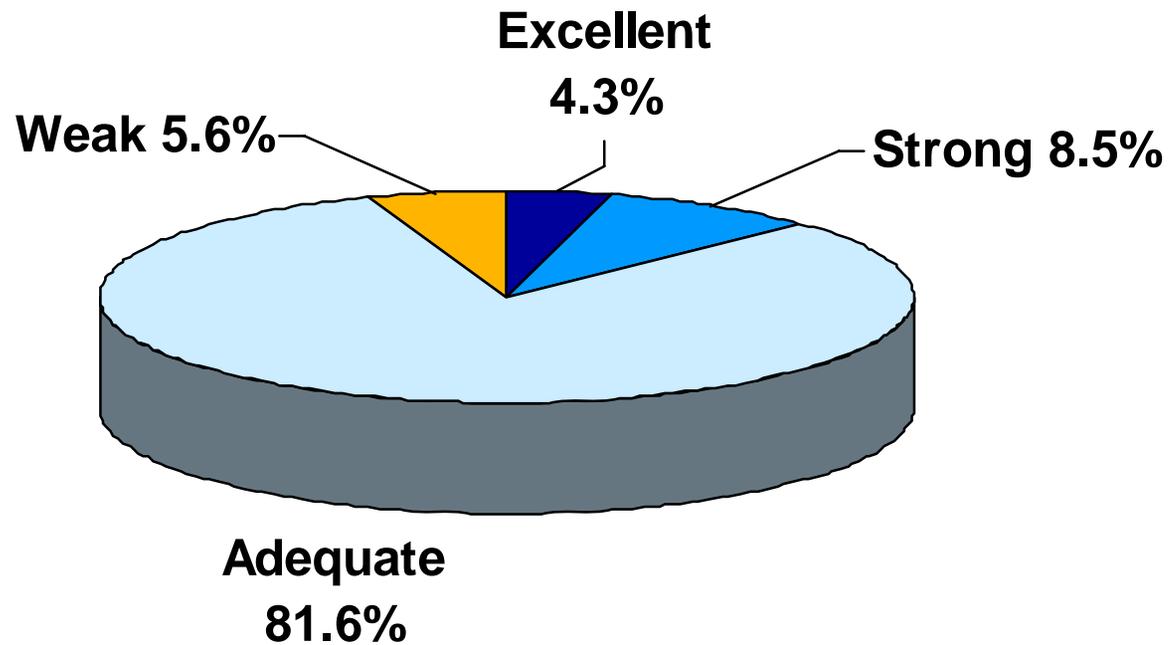
S&P emphasizes “strategic” enterprise risk management modeling

- Risk-based capital — Adopted in the 1990s and updated with latest approach introduction in 2007
- Enhanced capital modeling — Will rely more on Economic Capital (EC) for analytical purposes as modeling is updated
- Capital formula — S&P considers a company's total adjusted capital and compares with its estimated target capital to determine capital adequacy
- Company-specific — Modeling and measurement of risk must be specific to the company to support its retained risks
- EC is evaluated as part of ERM rating
 - “Strong” or “Excellent” ERM rating is a requirement for a ratings upgrade and/or partial recognition of EC model
 - The vast majority of companies receive an “Adequate” ERM rating
 - A “Weak” ERM rating could result in the company being put on “Credit Watch”

As of February 2007, only 13% of insurers had received “Strong” or “Excellent” ERM ratings from S&P

Overall ERM Evaluation

(207 Insurers - All Sectors)



Source: Standard & Poor's (February 2007)

Fitch: New view of insurance company capital using a proprietary model

“Prism” is Fitch’s new EC model

- Introduced in June 2006
- Global and fully stochastic — captures the risks, recognizing diversifications and concentrations
- Covering life, health and non-life business
- Fitch introduced Prism first in the U.S., U.K., Germany and France
- Consistent with VA C-3 Phase II approach – using CTE-levels varying by rating
- Will work with companies’ models and consider overall risk management of the company
- Companies can submit their models for a non-binding evaluation of likely capital requirements
 - Expected to provide partial credit for hedging

Moody's: Holistic view of risk management

Moody's view of risk management is based on four pillars

1. Risk governance
2. Risk mitigation
3. Risk measurement
4. Risk infrastructure and intelligence

Ratings connect amount of capital on balance sheet...

- Converging regulatory and economic views of capital adequacy
- Calculating EC focuses on areas to be included in modeling
 - Emerging risks
 - Asset liability
 - Mismatches
 - Operational risk
- EC modeling provides:
 - Understanding of an effective risk management framework
 - Common risk language across the firm
 - View of relationships and tradeoffs between different risks

A.M. Best: Strong EC model seen as a valuable tool for insurers

Enhancing BCAR capital adequacy model to:

- Address new risks
- Measure the volatility and correlation of risk

Rating evaluation process considers:

- Strength of the risk mitigation process
- Insurer's financial flexibility as part of long-term strength

Including in their process

- Stochastic modeling
- Evaluation of company's EC models – partial credit likely

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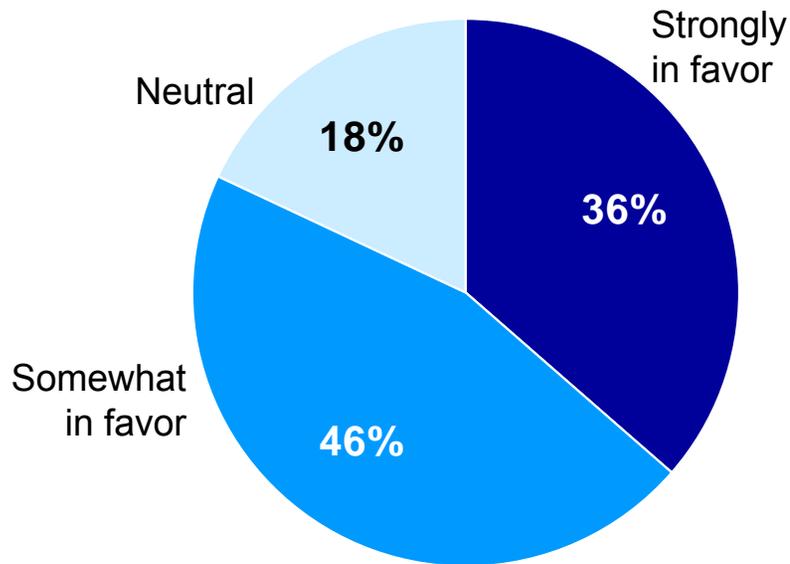
- Key Provisions of the New Regulation
- Reactions from the Rating Agencies
- **State of the Industry**
- Implications of the New PBR
- Appendix: Background on PBR

Background on Tillinghast CFO Survey

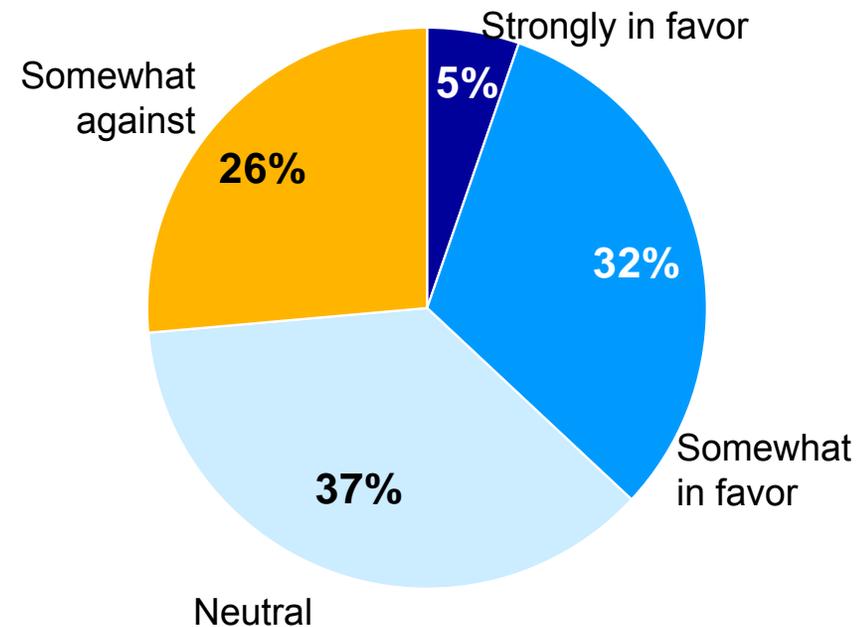
- Tillinghast CFO survey program provides CFOs with ability to benchmark their company against competitors
 - It also offers the benefit of independent analysis and perspectives
- Our panel consists of 70 CFOs from large and mid-size North American life companies
- We conduct three short Web-based surveys (10-15 questions) per year which focus on topical issues
- Participants receive an executive summary and detailed report of the findings; a less detailed general consumption document is shared with the press and general public
- The second of three surveys in 2006 explored the overall implications of principles-based regulation for reserves and capital

CFOs are overwhelmingly in favor of the concept of the new principles-based framework, but much less supportive of how it is being implemented

Support for the New Principles-Based Framework



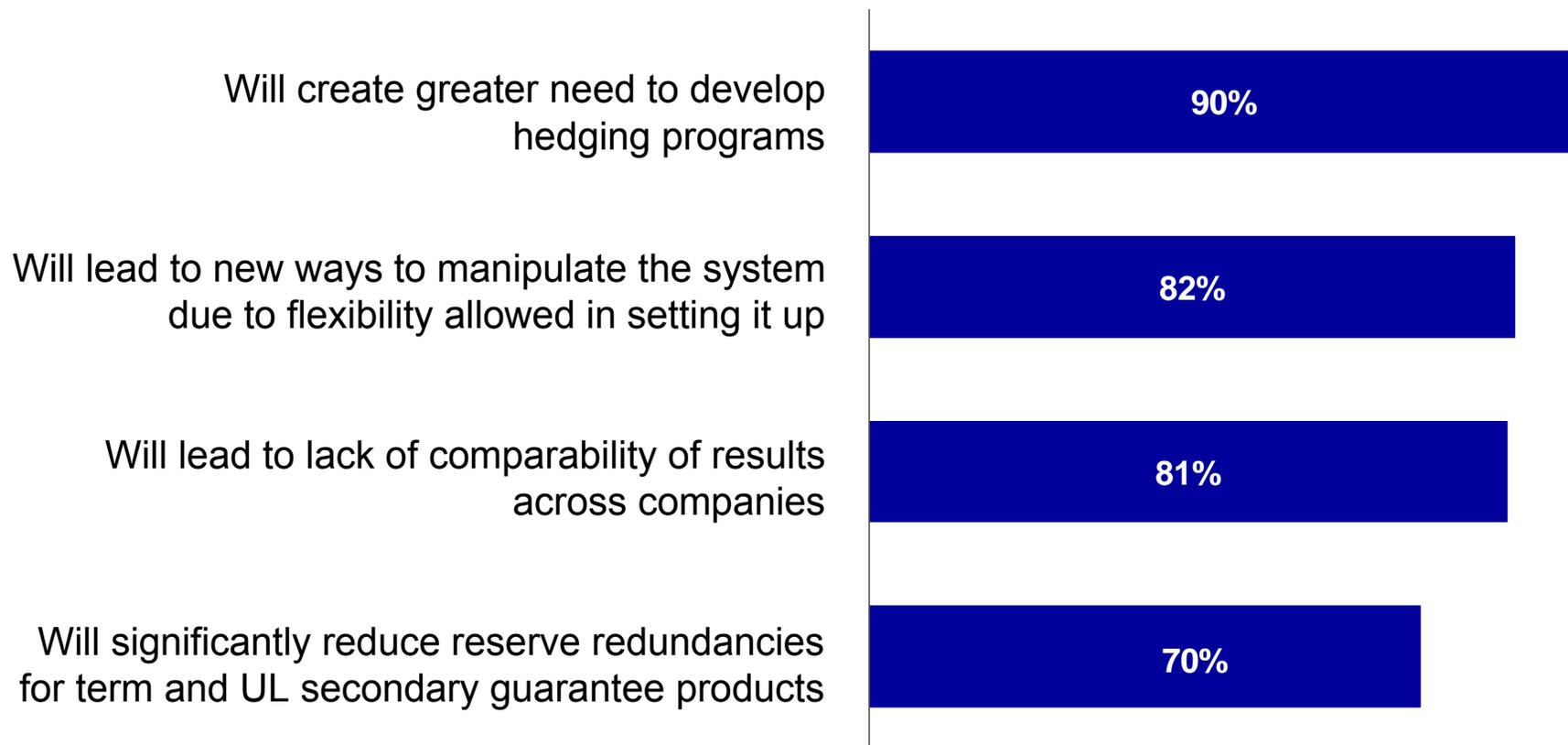
Support for How Principles-Based Framework Is Being Implemented



Source: Tillinghast CFO Survey (2006)

Respondents strongly believe that the new principles-based regulations will dramatically change the competitive landscape for life insurers in a variety of ways

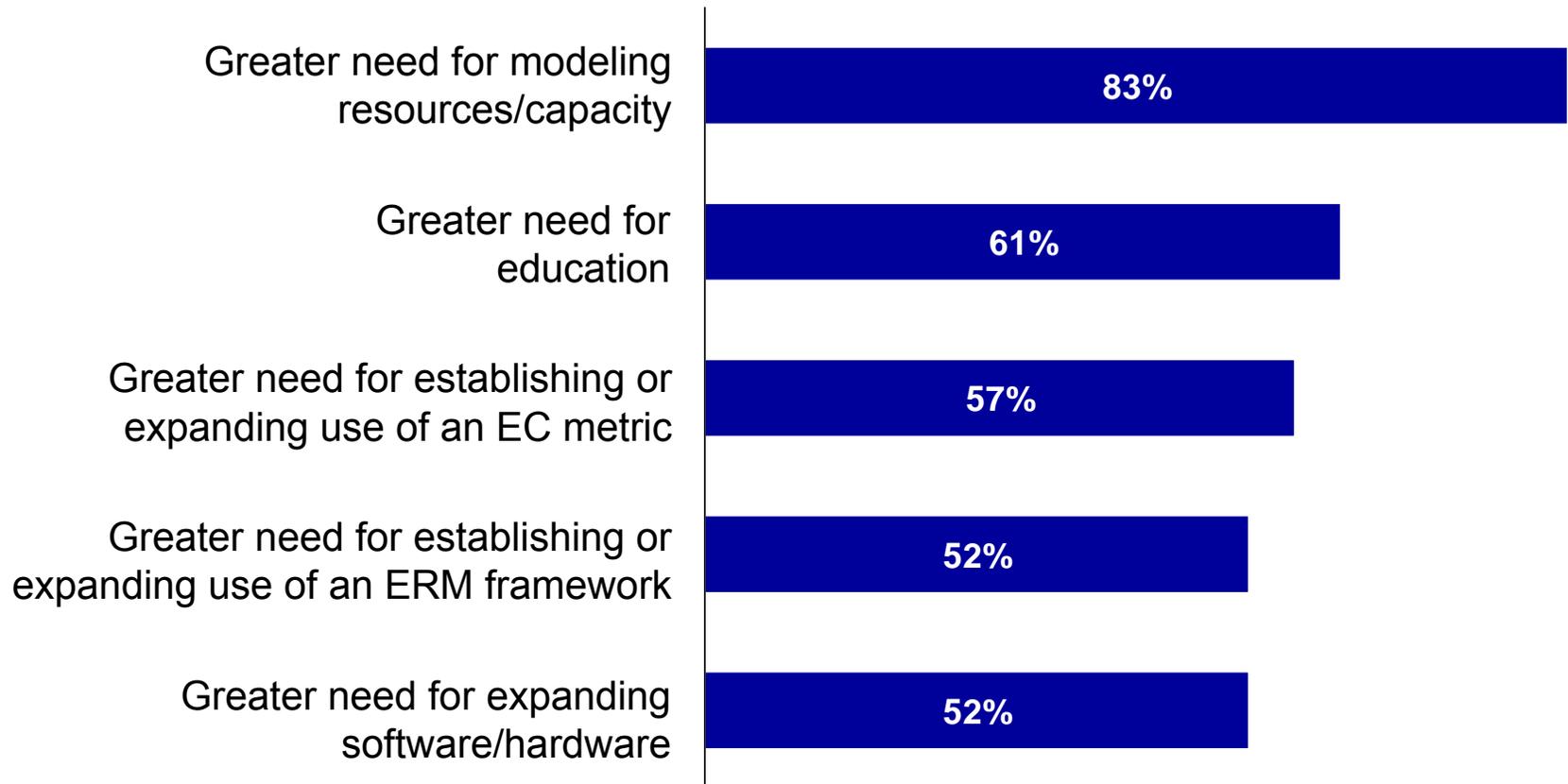
Anticipated Changes to Competitive Landscape



Source: Tillinghast CFO Survey (2006)

A majority of respondents indicated the new regulations will impact companies' existing risk management framework in five key areas

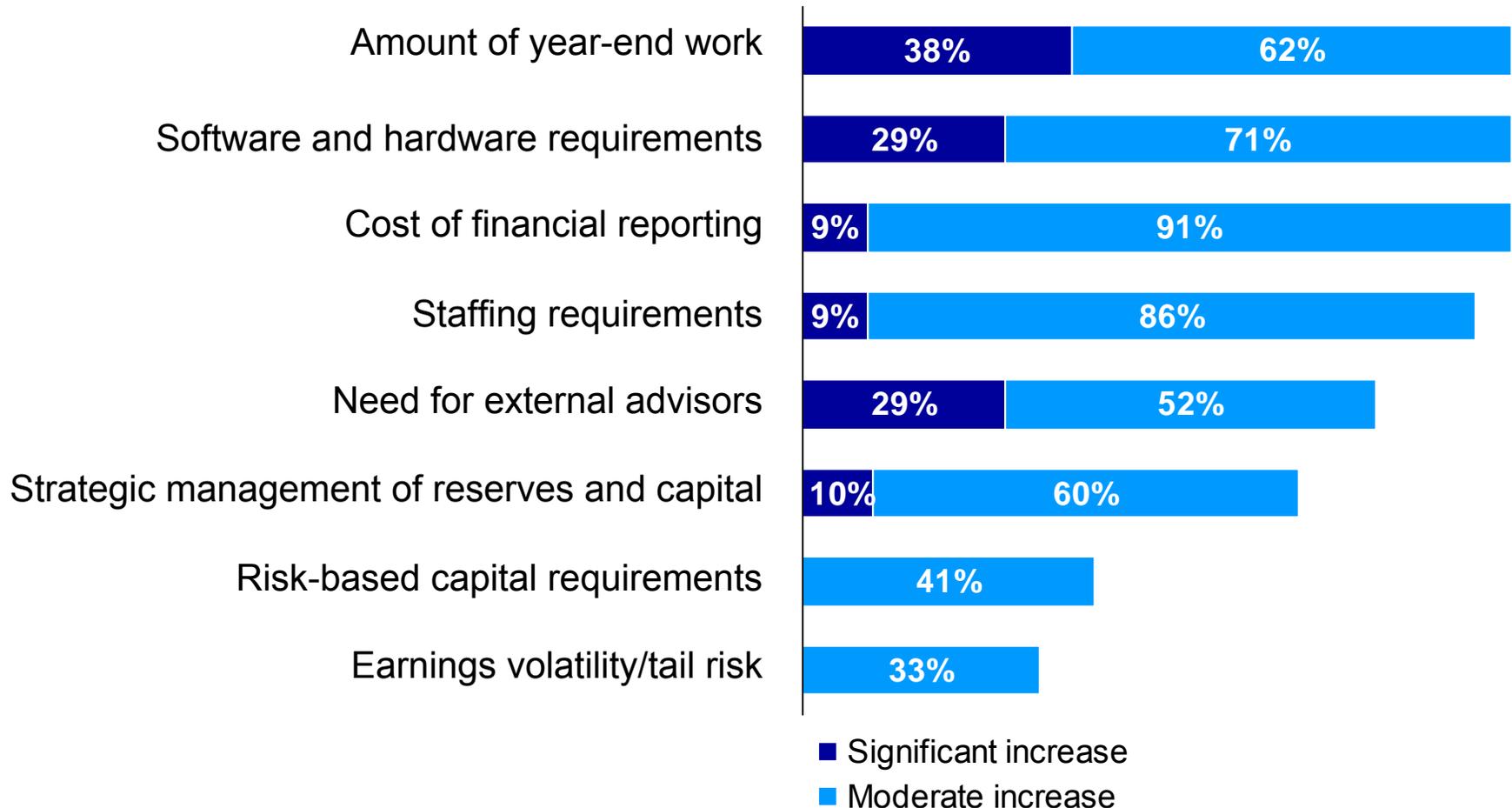
Impact of New Principles-Based Regulations on Existing Risk Management Framework



Source: Tillinghast CFO Survey (2006)

Most respondents expect the new regulatory framework to increase demands on their companies in six key areas, including the need for external advisors

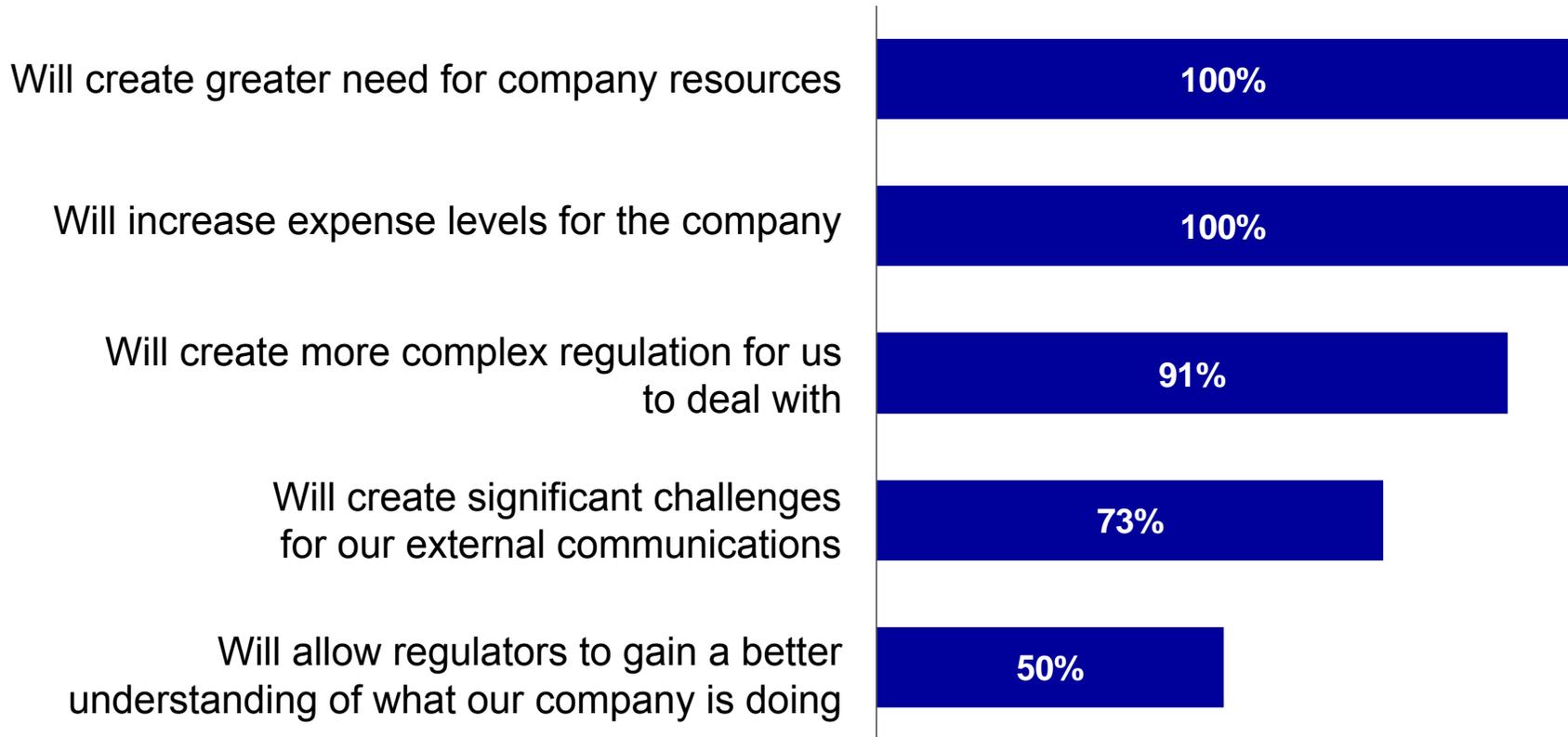
Impact of New Regulatory Framework on Company



Source: Tillinghast CFO Survey (2006)

Respondents overwhelmingly believe the new regulations will create a need for more resources, increase expenses and increase complexity in dealing with regulators

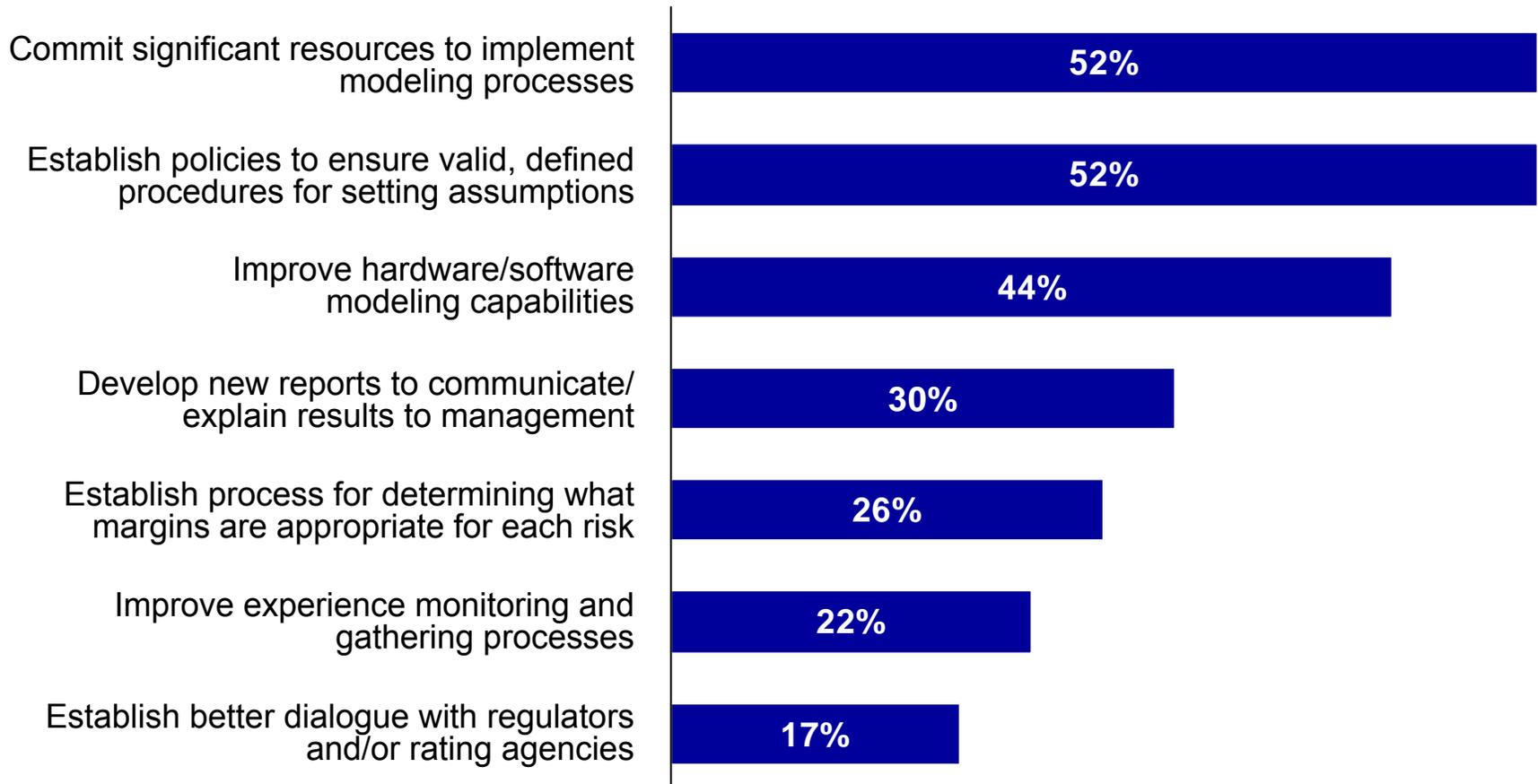
Anticipated Changes to Company's Approach to Dealing with Regulators



Source: Tillinghast CFO Survey (2006)

To ensure implementation success, companies will need to commit significant resources to modeling, establish rigorous assumption setting and improve modeling hardware/software

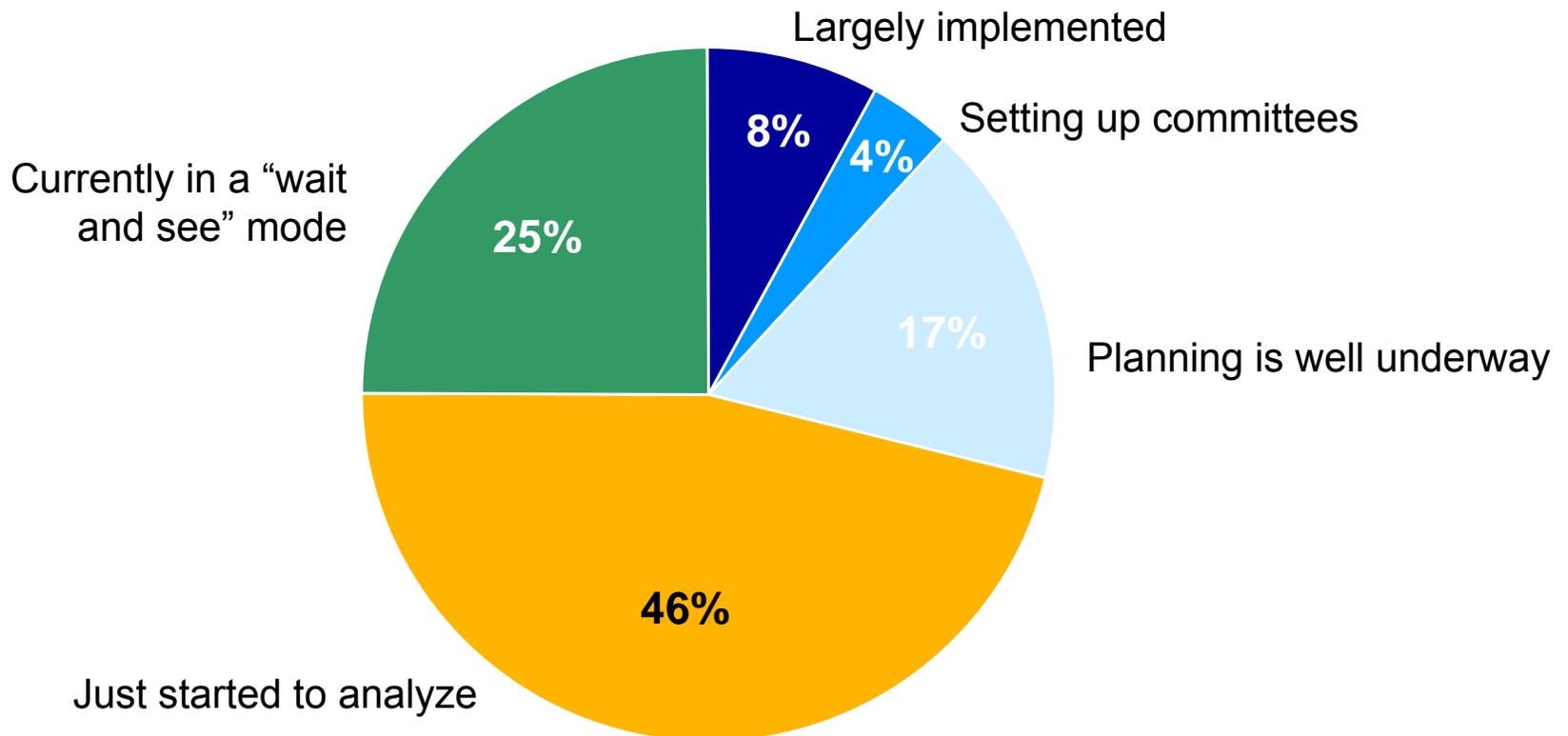
Requirements for Successful Implementation



Source: Tillinghast CFO Survey (2006)

Just over 70% of respondents have failed to make significant progress in preparing for the proposed new regulations

Progress in Preparing for New Regulations



Source: Tillinghast CFO Survey (2006)

Conclusions from the CFO Survey

- The status quo is not going to work for companies as they adapt to principles-based regulations
 - Preparing for and analyzing the potential impact of these new regulations should be a major priority for life insurers starting in 2007
 - Implementation of the proposed principles-based framework is a landmark undertaking that will lead to further bifurcation in the industry
 - Larger, more sophisticated companies will be better able to capitalize on the new rules through new products and risk management techniques
 - Companies are already seizing the opportunity to forge ahead
 - Innovative products with lower tail risk
- 
- Lower cost of capital and reserves
- 
- More competitive pricing/lower cost to consumers

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Implications of PBR on products

- Assessing, measuring and determining the risks associated with products will be the major change in product development and pricing
- Companies that price using a “deterministic” pricing model will need to educate pricing staff on stochastic approaches
- Substantially more discussion with the Valuation Actuary will be needed
- Need to determine approach to calculate expected statutory reserve levels for pricing (stochastic-on-stochastic)
- May need to increase modeling capabilities and/or size of actuarial staff
- Incorporating hedging into pricing necessitates using risk-free rates (need to check for “No Arbitrage”) and making an assumption about volatility

⇒ Exact impact on the level of capital and reserves by product and in aggregate is not known yet

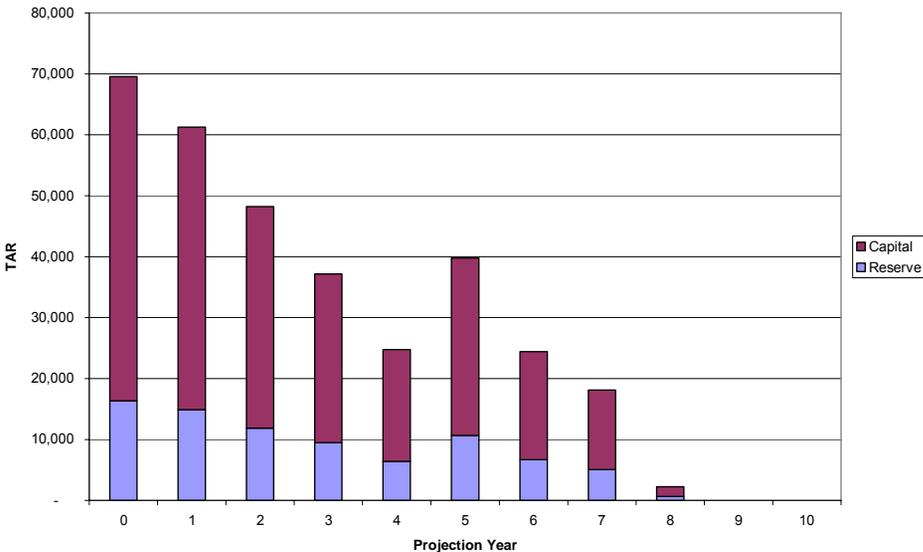
Impact of PBR on pricing function

- May see flurry of product development activities
 - Leading-edge companies are using their knowledge of the new regulation by introducing features that mitigate tail risk
- Since PBR is prospective, companies may implement conversion programs to move inforce blocks to new policy forms
- May see an increase in the frequency of experience studies to mitigate volatility assumptions
 - Modeling risk increases
- Increased use of stochastic pricing
 - Run profit analysis without, then with capital included
- Required capital is based on tail risk
 - Rating agency capital models are starting to incorporate the new PBR methodology
 - Implementing hedging programs can help alleviate increases in RBC requirements

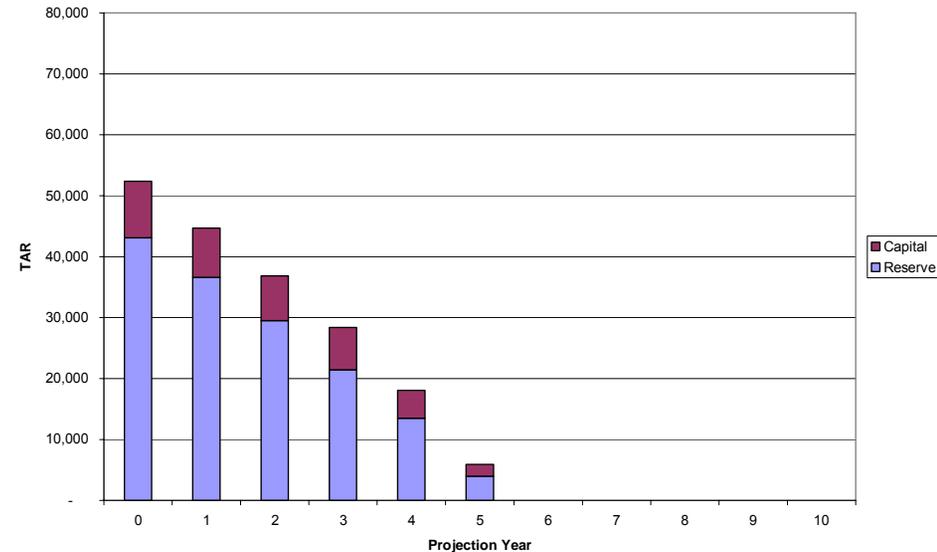
Case Study: Hedging can reduce RBC requirements



Total Assets for No hedge VA



Total Assets for Hedged VA



Key points

- Hedging reduces capital but may increase reserves (= CTE65) at time 0; TAR (=CTE90) is lower with hedging
- Capital (=CTE90 – CTE65) reduces over time for both, eventually going to 0 due to moneyness of GMAB and overall fee revenue

Source: Hartford Life

Impact of PBR on ERM and capital management

- Implementing PBR has enabled companies to better understand EC requirements for all products
- Increased scrutiny of regulators and rating agencies
 - All major U.S. rating agencies are currently developing or enhancing their capital adequacy models
 - Analysis of PBR implementation as part of ERM/EC assessment
- Focus on efficient use of capital
 - Leveraging regulatory work into better EC models
 - Implementation of EC via stress testing or full stochastic model
- Greater focus on enterprise risk management (ERM)
 - More volatility expected in capital/reserves, leading to greater financial volatility
 - Risk mitigation involves understanding of tail risk
- Better integration of functions using ERM framework
 - All areas need to work closer together

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